

**Report on break-out session 2 ‘Simulating the Land-Surface’
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Participants:

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Scientific Focus:

The group has commonly decided to concentrate on designing simulations that will address only one question:

‘What are the changes at the land-surface that drive climate change?’

Another way to ask the same question is: *‘what are the changes / shifts / fluctuations that have happened in the past that your model is unable to reproduce, and where do you think that land cover changes may play a role?’*

We have also agreed that the focus in terms of analyses for the next 2 years is two-fold:

- 1) The West African and the South Asian monsoons
- 2) The persistent droughts that have happened in North America (such as the Dust Bowl) (note added in Sept). The importance of this has risen due to a controversy over the land surface air temperature record of USA which is much affected by the Dust Bowl.

Suggested scenarios

Three sets of simulations have been discussed:

- (1) scenarios of the past 50 years, with and without land-use changes, at the global scale, with full external forcings (natural and anthropogenic) as in the last IPCC report (AR4);
- (2) scenarios where land-use changes will be applied only to specific regions to better address the focused analyses described above (North America, South Asia, Africa);
- (3) idealised scenarios over Africa to understand the role of land-surface processes in the development of the West African monsoon, and on the persistence of drought.

Additional scenarios may be run (IPSL, Hadley Centre) allowing for the dynamic vegetation in the parts of the grid-cells that remain natural.

Analyses, commitments and related projects

Existing projects, devoted to specific phenomena (e.g. monsoons) and/or regions (Europe), research scientists that are specialists on one region, have declared interest in analyzing the impact of accounting for land-use induced land-cover.

Those interests can be summarized as follows:

- (1) The West African Monsoon Experiment (WAMME; contact: Y. Xue)
- (2) Droughts in North America – US CLIVAR (Contact: S. Schubert)
- (3) European climate (Contact: C. Folland)
- (4) South Asian Monsoon (Contact to be defined within MAIRS)
- (5) Index characterizing extremes (Stardex indices; Contact: Aurore Voldoire)
- (6) Southern Hemisphere mid-latitude climate, e.g. Australia (Contact: S. Grainger)

Other general analyses of full atmospheric dynamics will also be carried out by individual groups. Further details in each of these areas will be worked out over the coming year. For example, the details of the work on European climate and soil moisture will be influenced by current research work on the summer North Atlantic Oscillation at the Hadley Centre.

Participating groups, contact point for these experiments

Institute	Country	Contact Person & email
IPSL	France	Nathalie de Noblet nathalie.de-noblet@lsce.ipsl.fr
CNRM / Météo-France	France	Aurore Voldoire aurore.voldoire@meteo.fr
Hadley Centre	England	Richard Betts richard.betts@metoffice.gov.uk
COLA	US	Jim Kinter or Paul Dirmeyer kinter@cola.iges.org or dirmeyer@cola.iges.org
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BOM	Australia	S. Grainger sgx@bom.gov.au

Connection with other projects:

Some of the simulations proposed herein are part of the international project LUCID (Land-Use and Climate: Identification of robust impacts) that is endorsed by both IGBP and WCRP (see iLEAPS Newsletter 4 published in July 2007). The main goal of this project is to identify the robust impacts, on climate, of land-use induced land-cover changes. To achieve this, a number of simulations will be run, with observed and/or computed sea-surface temperatures, with reconstructed changes of crop and pasture extent, and using a rather large number of climate models to further ensure the robustness of our results. We are in the process of recruiting climate groups to run some or all simulations. If you are interested, please send an email to 'nathalie.de-noblet@lsce.ipsl.fr' or, to join the whole group, to 'lucid@dsm-mail.saclay.cea.fr'. We are also now establishing a list of diagnostics (and associated requested variables) that will be applied to all models. If you wish to apply your favorite diagnostics to all models, please do not hesitate to write a few lines proposal to explain what you will do and what variables you need for that.